PROCEEDINGS OF THE BIOLOGICAL SOCIETY OF WASHINGTON
115(3):594–599. 2002.

A new species of *Montezumella* (Crustacea: Decapoda: Cheiragonidae) from the upper Eocene Ocala Limestone of Florida

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Abstract.—A new species of crab, *Montezumella microporosa,* is herein described from three, nearly complete carapaces collected from the upper Eocene Ocala Limestone of northern peninsular Florida. It is the first member of the genus to be described from the Atlantic and Gulf Coastal plains of the United States, and the fourth species of this extinct genus to be reported from North America. This new discovery provides further evidence that *Montezumella,* which originated in the Mediterranean during the middle Eocene, dispersed to Europe and the western Atlantic by the late Eocene.

Brachyuran crabs in Eocene deposits of Florida have not been well documented. Only six species: *Calappilia brooksi* Ross & Scolaro, 1964; *Calappa ocalana* (Ross et al. 1964); *Calappa robertsi* Ross et al., 1964; *Stenocionops suwanneeana* Rathbun, 1935; *Ocalina floridana* Rathbun, 1929; and *Paleocarpilius brodkorbi* Lewis & Ross, 1965 have thus far been described from the upper Eocene Ocala Limestone exposed in northwestern peninsular Florida, and a small portion of the Florida panhandle along the border of Georgia and Alabama. Additionally, *Lophoranina georgiana* (Rathbun 1935), described from the lower Oligocene Glendon Limestone of Georgia, was reported as occurring in the Ocala Limestone of Florida by Toulmin (1977). Although Toulmin's report with regards to the genus is correct, further study is needed to confirm his specific identification of this common Florida Eocene crab. Furthermore, a single specimen of *Portunus,* collected in the middle Eocene Avon Park Formation, was mentioned in Ivany et al. (1990), however, no description or figure was included.

Over the past several years intensive collecting in Florida's Ocala Limestone exposures, mostly at quarries and along riverbanks, has yielded a number of previously unreported decapods. Herein, we describe one of these newly discovered crabs which represents the first Florida Eocene crab to be described in over 35 years. The three, nearly complete carapaces of this new species were collected as spoil (float) from yet-to-be crushed limestone boulders in a quarry complex (see Fig. 1). None of the specimens was found *in situ* and therefore exact placement within the lower, middle, and upper portions of the Ocala Limestone was not possible. All specimens were prepared in the lab with dental picks and soft brushes. Once cleaned of adhered, soft, white limestone matrix, the specimens were coated with a thin solution of Butvar 76 diluted in acetone and then air-dried. Fossil crabs collected in association with this new species included the above-mentioned: *Ocalina floridana, Paleocarpilius brodkorbi, Lophoranina* sp. cf. *L. georgiana,* and *Calappilia brooksi.*

For a detailed discussion of the Ocala Limestone of Florida see Oyen & Portell (2001).

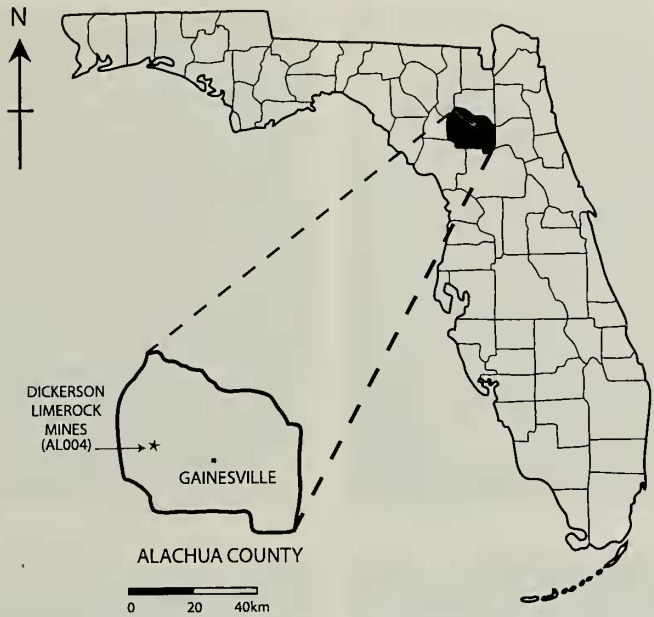

Fig. 1. Map of Florida showing type locality of *Montezumella microporosa*, new species, (Dickerson Limerock Mines (Haile Complex), UF locality AL004, USA, Florida, Alachua County, sec. 13, 23–26, T9S, R17E; Newberry Quadrangle, USGS 7.5′ series (1988).

Systematic Paleontology

Order Decapoda Latreille, 1803
Superfamily Cancroidea Latreille, 1803
Family Cheiragonidae Ortmann, 1893
Genus *Montezumella* Rathbun, 1930

Type species.—*Montezumella tubulata* Rathbun, 1930, by monotypy.

Range.—Middle Eocene to upper Oligocene/lower Miocene.

Montezumella microporosa, new species
Fig. 2

Material examined.—The holotype (UF 107150), paratype A (UF 75034), and paratype B (UF 103765) are dorsal carapaces reposited in the Invertebrate Paleontology Division, Florida Museum of Natural History (FLMNH), University of Florida (UF), Gainesville.

Measurements.—The holotype (UF 107150), paratype A (UF 75034), and paratype B (UF 103765) measurements (in mm) are presented in Table 1.

Type locality.—UF locality AL004, Dickerson Limerock Mines (Haile Complex), approximately 8.0 km northeast of Newberry along State Road 235, near the now defunct town of Haile, Alachua County, Florida (sec. 13, 23–26, T9S, R17E; Newberry Quadrangle, USGS 7.5′ series; Fig. 1).

Diagnosis.—Carapace longer than wide, rounded pentagonal; front wide, granulated, with 4 spines; preorbital and postorbital spines anteriorly directed; anterior dorsal surface ornamented with granules; gastric regions well defined by shallow grooves; branchial regions with short transverse rows of granules preceded by rows of minute pores; anterolateral margins with 4 granulated spines.

Description.—Carapace rounded pentagonal in outline, marginally longer than wide, widest anterior to mid-length, moderately arched longitudinally, more steeply inclined anteriorly, almost flat in transverse section. Gastric regions well defined by broad, shallow grooves; surface ornament with numerous, scattered, cratered granules

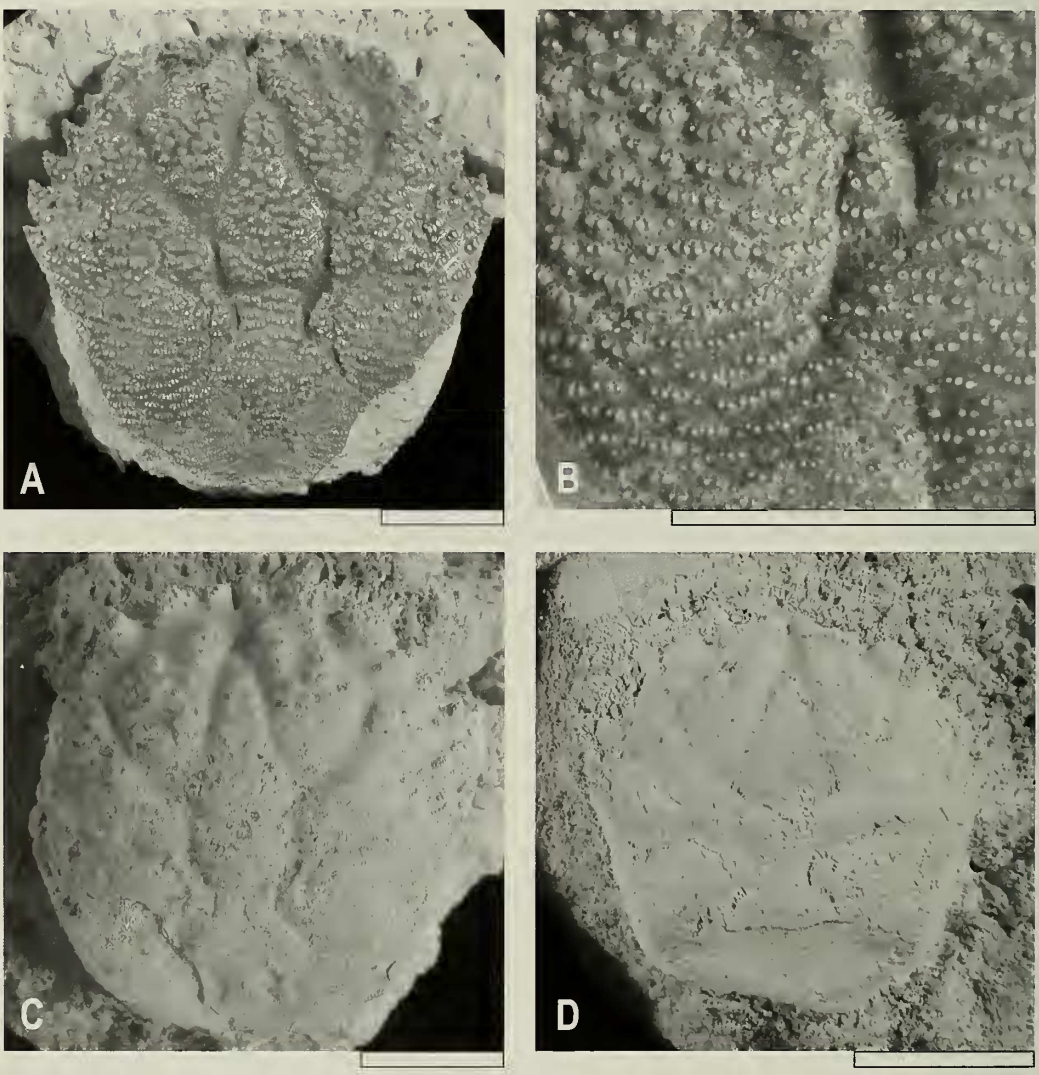

Fig. 2. *Montezumella microporosa*, new species. A, dorsal carapace of holotype (UF 107150); B, enlarged view of same exhibiting minute pores; C, dorsal view of paratype A (UF 75034); D, dorsal view of paratype B (UF 103765). Scale bars = 1.0 cm.

Table 1.—Dorsal carapace measurements (mm) of type specimens of *Montezumella microporosa*, new species. Maximum length (L), maximum width (W), width of front (W1), fronto-orbital width (W2), and posterior width (W3).

Specimen	L	W	W1	W2	W3
Holotype (UF 107150)	36.5	36.2	16.4	27.1	20.5
Paratype A (UF 75034)	32.2	31.0	14.9	23.0	13.0
Paratype B (UF 103765)	21.6	21.0	8.2	13.3	10.0

arranged in crowded clusters, short lines, or singly; minute even-sized pores interspersed with granules in small patches, or singly; generally, 1 or 2 rows of pores confront any linear arrangement of granules. Branchial regions less well defined; surface ornament with short, curving rows of granules (generally 4–6), again confronted by pores; granules overlap to form more or less transverse terraces; 'terraces' particularly sharp on branchial margin edges, where they curve forward. On weakly concave carapace sides, turned down almost at right angles to dorsal surface, lines give way to individual granules.

Front occupies median two-thirds of fronto-orbital margin, about three-fourths maximum carapace width, and projects slightly beyond large, triangular, preorbital spines. Front bilobed with broad, V-shaped median notch which leads back to deep sulcus, bridged distally; short, median notch and groove isolates this area; lateral to median notch, upper orbital margin bounded by broader notch and groove; lobes between notches granulated. Oblique upper orbital margin wide, raised, rounded; its margin pierced by two notches separated by triangular lobe; the smaller, postorbital spine triangular. Post-frontal depression broad with few granules. Anterolateral margins, short, curved, with 4 anteriorly curved spines; posterolateral margins spineless, converge in 2 weakly convex sections; posterior margin, nearly as wide as front, weakly concave centrally, bounded by ridge.

Cervical groove curves sharply inwards from margin, meets furrow separating protogastric lobe from tumid, circular hepatic region; turning back, it curves broadly around mesogastric lobe base just anterior to carapace midline. A short groove isolates small, triangular epibranchial lobe; from groove, branchiocardiac furrow runs sharply back before curving straight towards urocardiac junction; a posterior branch embraces subpentagonal urogastric lobe and anterior half of cardiac lobe. Protogastric lobes, elongate, rounded-triangular, anteriorly divided by grooves into ovate 'epigastric lobes' with small lateral node. Anteromesogastric process, narrows anteriorly, is rounded isosceles triangle in outline, with weakly concave sides and median furrow; its tip reaches beyond 'epigastric lobes'. Mesobranchial lobes vaguely trilobed; lateral and median lobes rounded, larger; inner, triangular lobe abuts urogastric lobe; cardiac region rectangular anteriorly, rounded-pentagonal basally; lunate node inserted between cardiac and metabrachial lobes.

Etymology.—The species name refers to the numerous minute pores comprising part of the carapace ornament.

Discussion.—*Montezumella microporosa* represents the first member of the genus to be described from the Atlantic and Gulf Coastal plains of North America. It not only differs in carapace outline and frontal details from the only other known U.S. species, *Montezumella eichorni* Schweitzer & Salva, 2000 (late Eocene, Washington), but also differs markedly with surface ornamentation. In *M. eichorni,* this is formed by paired or triple granules composed into short scabrous ridges continuous throughout the carapace length; whereas in *M. microporosa* the ridges are only fully developed on the branchial regions where they form denser, longer rows of granules. *Montezumella tubulata* (late Eocene, Mexico) lacks the post-frontal depression and differs otherwise in surface ornament. The singular arrangement of coarse granules also distinguishes *Montezumella casayetensis* Rathbun, 1937 (late Oligocene or early Miocene, Panama) from the new species. *Montezumella rutheni* van Straelen, 1933 (late Eocene, Bonaire) has a narrower frontal region and a much weaker branchiocardiac furrow. The middle Eocene *Montezumella amenosi* Via, 1959 (Spain) has a looser arrangement of branchial ridges, while the branchial ornament of *Montezumella scabra* Quayle & Collins, 1981 (late Eocene, England and Italy) has rather coarse orna-

mentation unlike the new species. The preserved portion of *Montezumella fraasi* Lőrenthey, 1909 (middle Eocene, Egypt) is readily distinguished by a more or less symmetrical arrangement of individual tubercules. Figures of *Montezumella elegans* (Lőrenthey in Lőrenthey & Beurlen, 1929) included by De Angeli (1995) among late Eocene crabs from Vicenza, Italy provide a clearer indication of ornament than that provided by Lőrenthey in Lőrenthey & Beurlen (1929). While the gastric regions are crowded with more or less even-sized tubercules, those on the metabranchial region are less sharp in contrast; short, linear granular rows are formed, but are more open, less regular, and sharper at the margin edges; in the latter respect, close to *M. microporosa.* However, *M. microporosa* differs in having a longitudinally divided anterior process of the mesogastric lobe. No comparisons to *Montezumella lamiensis* Rathbun, 1934 (Neogene, Fiji) were made because of the inadequate description and poor illustration of the holotype and only known specimen.

Schweitzer & Salva (2000) confirmed the proposal of Via (1969, 1970), greatly expanded by Quayle & Collins (1981), that *Montezumella* originated in the Mediterranean during the middle Eocene (*M. fraasi*) and subsequently dispersed to Europe (*M. amenosi, M. elegans,* and *M. scabra*), the western Atlantic (*M. rutheni* and *M. microporosa*), and Pacific region (*M. tubulata* and *M. eichhorni*) by the late Eocene. The only other known valid member of the genus, *M. casayetensis,* survived until late Oligocene/early Miocene times.

Acknowledgments

Larry Rogers, Limestone Products, Incorporated, Newberry, Florida kindly allowed access to the limerock quarry in which the new species of crab was discovered. George Hecht (FLMNH) photographed the specimens in Fig. 2 and provided assistance in the field. Financial support for fieldwork and the production of this paper was provided by the McGinty Endowment at the FLMNH. We especially thank Barbara and Reed Toomey, and James and Lori Toomey, for financial support to purchase field equipment that greatly enhanced our success of fossil collecting in the Ocala Limestone of northern peninsular Florida. This is University of Florida Contribution to Paleobiology 524.

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